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No. XIV.

MACHINE FOR MAKING SASH-BARS.

The SILVER MEDAL *was presented to Mr.* JOSEPH PAXTON, *Chatsworth, for the following Communication respecting his Invention of a Machine for the purpose of Making Sash-bars.*

Chatsworth, Derby,
13th March, 1840.

GENTLEMEN,

I BEG to submit to your notice the accompanying drawings and description of a machine for making sash-bars, which is in use at this place, and an account of which has not yet been published.

In constructing the great conservatory recently built here for His Grace the Duke of Devonshire, it was found desirable to contrive some means for abridging the great amount of manual labour that would be required in making the immense number of sash-bars necessary for a glass construction of such magnitude. Hence the origin of the present machine, which, in its first state, merely performed the part of a grooving machine; but was subsequently improved so as to make the bar complete.

As the conservatory was built under my own immediate superintendence, I can speak accurately as to the advantages of the machine. It has, as regards that building alone, performed the labour of *twenty* men for one *year;* and, consequently, saved in money about

1200*l*. The length of bars made by it for the conservatory would extend, in a direct line, upwards of forty miles.

The present machine was constructed for a particular purpose, which it has now satisfactorily accomplished; but, if one were to be permanently in use in any manufactory, or in the establishment of an extensive builder, the frame-work might be advantageously made wholly of cast iron, with polished plates for the gauge table; and, although the sash-bars made here are of a particular form, yet, by changing the character of the saws, sash-bars of any shape or form might be easily worked.

There is one particular feature in working the machine, namely, that the bar is presented to the saws below the centre of motion instead of, as is usual, above it, and also to the sides of the saws which are ascending from the table instead of the descending sides.

These arrangements were found necessary to suit the direction of the teeth to the grain of the wood; for, when the bar was presented in the usual way, the saws crushed instead of cut and cleaned the wood. When the machine makes twelve hundred revolutions a minute (which it is essential it should do), the saws not only cut but plane the wood; and it only requires afterwards to be rubbed a little with sand-paper. For very fine work, however, a second set of saws, with finer teeth than the first set, might be used.

When the immense labour is considered which is annually consumed in making sash-bars, even in London alone, the greater part of which might be saved by machines of this description, it is thought that the present invention will not be devoid of interest; and, with a view to public benefit, I forward these particulars, trusting that the drawings are sufficiently explanatory for practical purposes.

Should any further description be considered necessary, I shall be ready to furnish it.

I am, Gentlemen, &c. &c.

To the Society of Arts, &c. JOSEPH PAXTON.

The following letter was subsequently received from Mr. Paxton, in reply to inquiries relative to the economical working, &c. of the machine:—

Chatsworth, Derbyshire,
SIR, *31st March,* 1840.

IN answer to yours of the 27th inst. relative to the machine for making sash-bars, I subjoin the following:—

1. The machine was first used in its present form in August 1838.

2. The motive power is from an engine of four and a half horse power, employed on the premises for other purposes. Half of this power is required for the sash-bar machine, and half the expense of the engine, including attendance, &c. is 5*s.* a-day.

3. The machine can make bars at the rate of 600 feet an hour; but it cannot continue long at this rate, as time is required both to cool and sharpen the saws. The average number of bars per day is 500 four feet lengths; or 2000 feet.

4. The greater number of bars used here have been made from Riga deal, and some from oak, &c.; but any well-seasoned wood may be used.

5. The attendants required for the machine are only a labouring man and a boy.

6. The first cost was 20*l.*

I am, Sir, &c. &c.
JOSEPH PAXTON.

W. A. GRAHAM, Esq.
Secretary, &c. &c.

P.S.—Herewith I have sent a specimen of the sash-bar.

Reference to the Figures.

Fig. 1, section of a sash-bar, half size; the other figures are one-eighth. Three operations finish the bars like fig. 1. Fig. 2, an end view of the whole machine; A B C an iron frame fixed across the bench D D; E E its poppets, between which the axis F F is mounted, having on it all the cutters Q, the driving pulley H, and the circular saw I I fixed by the screw nuts G G; J the saw-table, having on it the bed K, whose slope is made to the right bevel for the sash-bars; L the guage; M a plank of the right thickness, out of which the bars are to be cut; it is shewn on the bed K with the saw I I in the act of cutting off one bar N; the plank is then laid with its upper side undermost on the bed; the next bar is cut off, and the operation thus continued, the plank being reversed for every cut: this is the first operation. Each bar N, as it comes from the plank, is to be laid on the bed O against the gauge P, and passed under the cutter Q: this second operation will finish one side of it. The finishing table R is then raised a little by two adjusting screws S, one at each end, and fixed by the screw T; the bars are again passed under the cutters Q, with their other sides upper-most: this third operation finishes them ready for use.

Fig. 1.

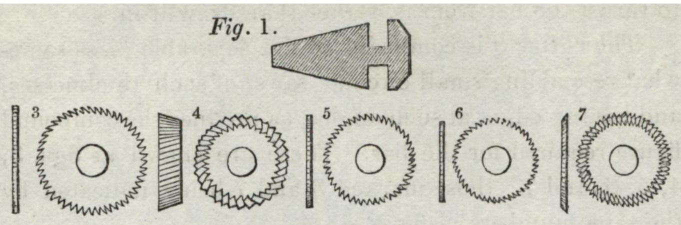
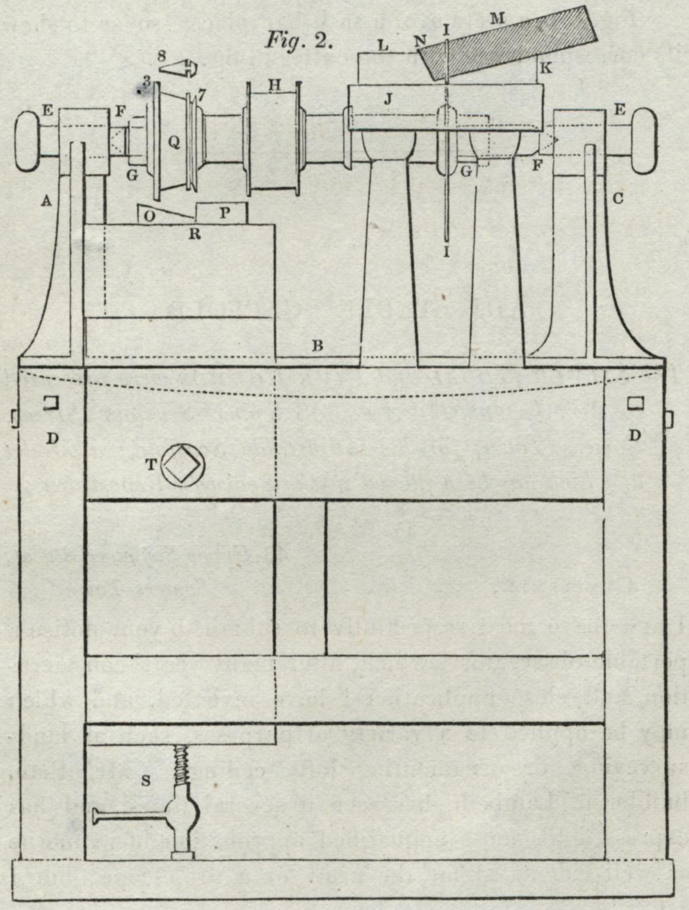


Fig. 2.



The motion of the cutter Q meets that of the bar, tending to thrust the bar from it, rather than draw it in.

The cutter Q is composed of five separable discs somewhat resembling small circular saws, of such thicknesses, and having edges at such angles, as produce the compound figure required for the bar. These are shewn at figs. 3, 4, 5, 6, and 7; those marked 3 and 7 being indicated by the same numbers in fig. 2.

Fig. 8 is a section of a sash-bar placed so as to shew its correspondence with the cutter in fig. 2.

No. XV.

ADJUSTABLE SCAFFOLD.

The SILVER MEDAL and FIVE POUNDS were presented to Mr. JAMES REEVES, 43 Upper Seymour Street, Somers Town, for his Adjustable Scaffold; a Model of which has been placed in the Society's Repository.

43 Upper Seymour Street,
Somers Town.

GENTLEMEN,

I BEG leave most respectfully to submit to your notice a portable observatory, which, after many years' consideration and close application I have invented, and which may be applied to a variety of purposes, such as land-surveying, or ornamenting lofty ceilings. Mr. Peto, builder of Lambeth, has seen it several times, and has expressed his most unqualified approbation of its merits as well calculated for the army or a fire-escape; but I